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AMERICAN

STATISTICAL ASSOCIATION.

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Read before the AMERICAN STATISTICAL ASSOCIATION, May 9, 1890.

THE STUDY OF STATISTICS IN ITALIAN UNIVERSITIES.

BY CARROLL D. WRIGHT.

At the joint session of the American Economic Association and the American Historical Association at Cambridge, in May, 1887, I had the honor to read a paper on "The Study of Statistics in Colleges." I was fortunate enough to be able to present at that time the programmes of some of the universities in Europe, but I had not been able to secure the line of work carried on in Italian institutions of learning. Through the courtesy of Signor Bodio, of the Department of Agriculture and Commerce at Rome, I have been able to collect information relating to Italy, and feeling that this information ought to be put in permanent form, that our own colleges and universities may have the benefit of it, I have been glad to present it to the American Statistical Association, that it may become a part of its public work.

Not only is the science of statistics taught in the universities of Italy, but it is taught also in every one of the technical institutes of the country, about eighty in number. These institutes correspond to the *Höheren Realschulen* of Germany, and to the *Enseignement Secondaire Special* of France. It is an obligatory study for the law students in the universities, and it must include the theory of statistics and the statistics of the kingdom. The professors of the universities are free, however, as regards the lessons they may offer, and they are accustomed to develop in each year those parts of their respective programmes which they think most convenient. The programmes of the courses of the most learned of the professors of statistics, namely, Senator Messedaglia, of the University of Rome, and Senator Boccardo, formerly Professor of the University of Genoa, and now Consigliere di Stato, for the academic year 1888–89, and of Prof. Carlo F. Ferraris, of the University of Padua, were as follows: —

COURSE OF STATISTICS

HELD BY PROF. A. MESSEDAGLIA (SENATOR OF THE KINGDOM) IN THE UNIVERSITY OF ROME.

A. THEORY OF STATISTICS.

I. General idea of statistics and its conception as a social science.

II. Origin and historic development of statistical science. Double order of inquiries and studies: Historical-political, and mathematical. Statistics as now understood.

III. Analysis of the knowledge of statistics.

1. Object of statistics. Nature and conditions of the statistical data.
2. Action and aim of statistics. Results, laws, casual relations; research and determination of the above topics. Nature and character of the statistical laws. Classification of the causes. Law of the accidental causes properly called.
3. The method. Logical characters of the statistical method properly considered. Its general application to the sciences of observation.

IV. Limits of statistics and its affinity with other sciences. Mathematics as an auxiliary science of statistics.

V. Present increasing importance of statistics.
   1. Considered scientifically and as aiding other sciences.
   2. Practically considered, in the ordinary contingencies of social life.

VI. Means and process of compiling statistics.
   1. Gathering of the data. Several methods for this topic.
   2. Criticising of the data.
   3. Elaboration of the data.
      a. Technical or material.
      b. Logical or scientifical.
   4. Tabulation and publication of the results.

VII. General rules for the discussion and application of the statistical data.
   Special study of the law of great numbers.

VIII. Study on the comparability of the data. General conditions of comparability and process of reduction necessary to render the data as comparable as possible.
   Particular applications to demographic, commercial, and financial statistics.
   Examination and comparison of Italian, French, and English budgets, or financial statements from the standpoint of their comparability.

IX. Mathematical methods, both analytical and geometrical, which find their application in statistics.
   The theory of the probability. Errors of observation. Empirical attainment. Geometrical constructions, or drawing as a way to represent and discuss the data.

X. General partition of statistics.
   1. Territory and climate.
   2. Population (Demography).
   3. Vitality.
   4. Economical and social conditions.
   5. Intellectual conditions.
   6. Moral conditions.
   7. Political conditions.
   A synthetic résumé of the several data which represent the social life of the country.

B. STATISTICS OF THE KINGDOM.

These are treated according to the data at hand, and always in the form of comparison, confronting province with province, when treating of home statistics, and Italy with other nations, when making international comparisons.

The method of instruction is usually by monographs upon different subjects, as, for example, population, criminal statistics, finances, etc., seeking to treat each as exhaustively and interestingly as possible. Thus, in the University of Rome, in the past scholastic year 1888–89, the programme of the statistics of population or demography included the following general inquiries: —

I. Population considered in its present condition. Corresponding statistical documents. General census as taken periodically. Other documents relative to it.
   1. Absolute population, or considered only in its number, as a matter of fact. Actual and legal population.
   2. Relative population, or in relation to the extent of the territory. Density. Map showing the distribution of the Italian population, according to the territorial extent. Centred and scattered population. Economical and social importance of the results of the above data.
   3. Specific population.
      a. Sex.
      b. Civil condition (single, married, widowed).
      c. Age. Economical and social importance of this inquiry. Difficulty in ascertaining it with accuracy; and relative corrections of the same.
         Distribution by age in relation to births, deaths, and to the stationary or progressive condition of population.
         Special comparisons with foreign countries. United States of America, France, Italy.
      d. Nationality. Ethnographical statistics of Europe.
      e. Religion. Religious statistics of Europe.

- *f.* Trades and occupations. Methods and ways of obtaining the above data. International comparisons.
- *g.* Property-holders.
- *h.* Instruction.
- *i.* Political condition.
- *k.* Physical defects. Anthropometrical data.

II. Population considered in its movement. Corresponding statistical documents.

1. Intrinsic movement (natural reproductive power).
    - *a.* Marriages.
    - *b.* Births.
    - *c.* Deaths.

    Each one of these topics studied in all its interesting aspects and in a comparative form.
2. Extrinsic movement (social, migratory changes). Emigration and immigration.

III. Statistical laws of the movement (Bionomy) in relation to the general economical conditions of population.

IV. Measure of vitality (Biometry). Tables of mortality and of surviving. Average life and probable life. Methods of constructing the above data.

COURSE OF STATISTICS

HELD BY PROF. G. BOCCARDO (SENATOR OF THE KINGDOM) IN THE UNIVERSITY OF GENOA.

1. Statistics as an art and as a science. Its historic evolution. Its relations with the other social sciences, more especially with the political economy.
2. The methods of research and those of exposition.
3. The law of great numbers. The means, averages, and median values. The statistical probability and prevision.
4. Distribution of the statistical researches.
    - *a.* Residence of people (territory, climate, etc.).
    - *b.* People.
    - *c.* Institutions of the people (government, religion, administration, etc.).

5. The statistics of the people (Demography) is more proper than any other part of the statistical research to be scientifically treated: reasons of that. Therefore, it is selected as the subject of the course.
6. Chief division of demography. Static and dynamic.
7. The practical basis of the static demography. The census. History and technics of the census. Comparative data.
8. The practical basis of the dynamic demography. The registers of the civil state. The theoretic population.
9. Nativity. Births of different sexes in time and space.
10. Mortality. Tables of mortality, and methods of their formation. Average age. Average life. Probability of life. Accidental death. Military death.
11. Marriage. Celibacy. Widowhood.
12. Emigration. Its different sorts. Its statistical and social effects.
13. The social classes. The professions. Property. Pauperism.

STATISTICS.

PROGRAMME OF LESSONS

BY PROF. CARLO F. FERRARIS, UNIVERSITY OF PADUA, ITALY.

INTRODUCTION.

I. Definitions of statistics.
II. Their theoretical divisions.
III. Their history.

PART I.* THEORY OF STATISTICS.

1. Statistics as an auxiliary method of induction. The analysis of facts with regard to their quality as a preliminary operation.
2. The collection of facts expressed in numbers.
3. The grouping of numbers. Notion of statistical quantities and series.
4. Elaboration of numbers. General notions, especially of the mathematical theories of application in statistics.
5. Elaboration of numbers (continued). Relative frequency of facts; proportional values.

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* This part is fully treated every year.

6. Elaboration of numbers (continued). Averages.
7. Elaboration of numbers (continued). Some special and the most interesting applications of probability to social facts.
8. Interpretation of numbers. Regularity in phenomena and the law of causation.
9. Interpretation of numbers (continued). The logical methods for singling out the causes.
10. General results of statistical inquiry. Statistical laws.
11. Auxiliary operations in statistics and graphical figurations.

PART II. IMPORTANT QUESTIONS IN TECHNICAL STATISTICS.*

1. General census of population.
2. Special census of professions.
3. Registration of marriages, births and death, life tables, immigration and emigration.
4. Criminal statistics.
5. Statistics of economics, especially *a*, of money; *b*, of prices; *c*, of wages; *d*, of transports; *e*, of international trade.
6. Financial statistics.
7. Organization of official statistics.

PART III.† DESCRIPTIVE AND INQUIRING STATISTICS.

INTRODUCTION.

Notion of the social subjects, which may be the object of statistical description and inquiry.

1. The distribution of population on the country and its composition according to age, sex, and condition as to marriage (family condition, *stato civile*).
2. Marriages and births.
3. Migrations.
4. Wealth.
5. Intellectual culture.
6. The state and its forces.
7. Professions.

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* Choice was made observing that statistics is explained to the students of the faculty of law and political science. Owing, however, to the shortness of the academic year, it is impossible to treat fully the matter in this and the following part every year.

† See the preceding note.

8. Criminality.
9. Biometry and mortality.
10. Law of population.

As regards the general methods of inquiry, the comparative form is always followed, and even in the theoretical part each rule is illustrated by examples and comparisons of facts; so also as regards the history of statistics, which is exemplified by particular references to some economical topics, as, for instance, to the general census of population. The general history of statistics in the Italian universities is often treated separately, as a part of a theoretical course, as has been done by Prof. Gabaglio, at the University of Pavia, in his well-known treatise.

The pamphlets of Prof. Messedaglia, "*Storia dei metalli preziosi*," "*La moneta*," "*I valori medi*," "*Statistica teorica ed italiana*," and "*La scienca statistica*," and Prof. Gabaglio's work, "*Teoria generale della statistica*," indicate most thoroughly the important position held by statistical science among Italian officials and educators, and the progress achieved in teaching that science in the Italian schools of superior instruction. The grand position indicated by the programmes given and the works cited is the direct outcome of the wonderful progress which the Italian government has made in the collection and presentation of statistical information. In the official statistics of Italy Signor Bodio has led the way, and the constant and rapid publication of statistical works of the very highest value, covering almost every important feature of social and industrial life, offer examples for other countries.

While much of the work in the Italian schools may be easily obtained from the yearly Reports of Commerce and Industries of Italy and other countries, it will be seen from the programmes that in Italy much importance is given to the methods and history of statistics, and that as regards the application of statistical science great stress is laid upon its demographical and moral aspects.

It is only recently that Sig. Egisto Rossi, well and personally known to members of our association, published a work on public instruction in the United States, entitled "*La istruzione publica negli Stati Uniti*," for the benefit of the Italian people. I am not aware that anywhere, in the English language, is there so complete and so compact a statement of all the important features of public instruction in the United States. This is only an instance of the efficiency and the wide-reaching efforts of the Italian government in placing before its people the results of research. Augmenting this official work with the very best methods of teaching statistical science, not only in the universities, but in the technical institutes, Italy is making strides in statistical science that may well excite our admiration and stimulate our emulation.